Original Article

Maternal Mortality in Pakistan: An Attention Seeking Problem

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Abstract

Objective: Objective of the study was to determine the maternal mortality ratio and major causes of maternal mortality in different tertiary care hospitals representing each province of Pakistan.

Study Design: Empirical study

Duration & place of Study: Two years; from January 2014 to December 2015 at Sir Ganga Ram Hospital Lahore.

Methodology: Data was collected from patients' record from four tertiary care hospitals of the country. All maternal deaths due to direct or indirect causes were included in the study. Deaths of mother's due to accidental or incidental causes were excluded. Data was analyzed and qualitative variables were calculated in percent while quantitative variables were measured using mean and standard deviation.

Results: Total number of live births during the study period was 101010. Out of these, total maternal deaths were 456. Maternal mortality ratio was 451.4/100,000 live births. Mean age and parity of patients was 30.6±6.1 years and 4.0±3.0 respectively. Maternal deaths due to direct causes were 373 (81.8%), due to indirect causes were 81 (17.8%) and in 2(0.4%) cases, the cause was unknown. Most common direct cause of maternal mortality was haemorrhage in 151(33.1%) patients followed by hypertensive disorders in 103(22.6%), sepsis in 43(9.4%), pulmonary embolism in 27(6%), obstructed labour in 28(6.1%), anesthesia complications in 10 (2.2%), ruptured ectopic pregnancy in 7(1.5%) and acute fatty liver of pregnancy in 4(0.9%). The most common indirect cause was anemia in 31(6.8%) patients followed by acute hepatitis in 28 (6.1%), cardiac disease in 17(3.7%) and anaphylactic reaction in 4(0.9%) cases.

Three hunded and forty (74.6%) maternal deaths were in postpartum period. Only 60(13.2%) mothers registered their pregnancy for antenatal care.

Conclusion: Maternal mortality ratio is alarmingly high in our country. Hemorrhage & anemia are identified as the leading direct & indirect causes of maternal death respectively. Both can be prevented by improving antenatal care and strengthening emergency obstetric services.

Keywords: Maternal, Mortality, Pakistan, Safe motherhood.

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Introduction

Maternal mortality is a serious issue throughout the globe. In 2015, approximately 303000 maternal deaths occurred globally and 99% of these were in developing countries.[1] In Southern Asia, maternal deaths are approximately 66000 per year.[1] Substantial differences have been recorded in maternal mortality ratio in different countries in the world. Although overall maternal mortality ratio is reduced by 44% in past 25 years worldwide.[1] Women are still dying of complications of pregnancy and most of the deaths remain unrecognized.[2]

Maternal Mortality is defined as, "death of a woman while pregnant or within 42 days of termination of pregnancy irrespective of duration and the site of pregnancy from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes".[3] The causes of maternal mortality can be direct or indirect. In developing world mothers usually die due to haemorrhage, hypertensive disorders of pregnancy, unsafe abortion, sepsis, obstructed labour, anaemia and hepatitis etc. Most of these complications are preventable and can be treated effectively in a health care facility.[4]

One of the Millennium Development Goals set for 2015 was to reduce maternal mortality by three-quarters.[5] In Pakistan, although there is a decline in maternal mortality ratio over the years but still the situation is very alarming.[6,7] It varies in rural and urban population, in educated and illiterate, low and high socioeconomic group. Contributing factors are inadequate health care facilities, lack of awareness, financial constraints, poor accessibility and cultural practices.[8]

Methodology

Data was collected from the four busiest tertiary care government hospitals of the country, Sir Ganga Ram Hospital (SHRH) Lahore, Jinnah Post Graduate Medical Center (JPMC) Karachi, Lady Reading Hospital (LRH) Peshawar and Bolan Medical College Hospital (BMCH) Quetta representing each province of Pakistan. It was a retrospective analysis conducted after approval of ethical review board.

Demographic variables like age, obstetric characteristics like parity, antenatal booking status and causes of maternal death were collected from patients' hospital record and annual mortality statistics over a period of two years from January 2014 to December 2015. All maternal deaths due to direct or indirect causes were included in the study. Deaths of mothers due to accidental or incidental causes were excluded. Data was analyzed and qualitative variables were calculated in percent while quantitative variables were measured using mean and standard deviation.

Maternal Mortality Ratio (MMR) is designed to express direct or indirect obstetric risk.[2] It was calculated using, MMR = Number of maternal deaths during a reference period/Total no. of live births during the same period x100,000 [2,3]

Results

Total number of live births was 101010 during the study period; out of these total maternal deaths were 456. Mean age of the patients was 30.6±6.1years and the majority (56.8%) was in the age group of 21-30 year. Mean parity was 4.0±3.0 ranging from para 1 to para 13. The majority of the mothers who died were multipara 172(37.7%) and grand multipara 136(29.8%). Only 60(13.2%) mothers were registered in a maternity unit for antenatal care. Most of the mothers (74.6%) died in postpartum period as shown in table I.

Causes of maternal mortality are shown in table II. The commonest direct cause of maternal mortality was hemorrhage in 151 (33.1%) cases followed by hypertensive disorders in 103 (22.6%) mothers. Among haemorrhage, postpartum haemorrhage was more common being a cause in 114 (75.5%) and antepartum haemorrhage in 37 (24.5%) cases.

Overall maternal mortality ratio from the four tertiary care hospitals was 451.4/100,000 live births. Maternal mortality ratio in different tertiary care hospitals is shown in Figure 1.

Table I: Demographic & Obstetric Characteristics						
Variable	**SGRH(Punjab)**	**JPMC(Sindh)**	**LRH(KPK)**	**BMCH(Baluchistan)**	**Total**	**%age**
Age (Years)						
≤20	04(10.2%)	29 (19.6%)	025(13.7%)	11(12.8%)	069	15.1%
21-30	28(71.8%)	92 (62.1%)	102(55.7%)	37(43.0%)	259	56.8%
31-40	07(18%)	26(17.6%)	049(26.8%)	31(36.0%)	113	24.8%
41-45	00	01(0.7%)	007(3.8%)	07(8.2%)	013	03.3%
Total	**39(100%)**	**148(100%)**	**183(100%)**	**86(100%)**	**456**	**100%**
Parity						
P1	13(33.3%)	39(26.3%)	60(32.8%)	16(18.6%)	128	28.1%
P2-P4	20(51.3%)	70(47.3%)	48(26.2%)	34(39.5%)	172	37.7%
P5-P9	05(12.8%)	38(25.7%)	65(35.5%)	28(32.6%)	136	29.8%
P10-P13	01(2.6%)	01(0.7%)	10(5.5%)	08(9.3%)	020	04.4%
Total	**39(100%)**	**148(100%)**	**183(100%)**	**86(100%)**	**456**	**100%**
Booking Status						
Booked	06(15.4%)	019(12.8%)	021(11.5%)	14(16%)	060	13.2%
Un-booked	33(84.6%)	129(2.6%)	162(88.5%)	72(84%)	396	86.8%
Total	**39(100%)**	**148(100%)**	**183(100%)**	**86(100%)**	**456**	**100%**
Pregnancy Status						
Postpartum	27(69.2%)	91(61.5%)	148(80.9%)	74(86%)	340	74.6%
Antepartum	12(30.8%)	57(38.5%)	035(19.1%)	12(14%)	116	25.4%
Total	**39(100%)**	**148(100%)**	**183(100%)**	**86(100%)**	**456**	**100%**

Table II: Causes of Maternal Mortality						
Causes of Maternal Mortality	**SGRH (Punjab)**	**JPMC (Sindh)**	**LRH (KPK)**	**BMCH (Baluchistan)**	**Total**	**%age**
Direct Causes					**373**	**81.8%**
Haemorrhage	07(18%)	53(35.8%)	64(34.9%)	27(31.4%)	151	33.1%
Hypertensive disorders	09(23%)	34(22.9%)	46(25.1%)	14(16.3%)	103	22.6%
Sepsis/ Unsafe abortions	06(15.4%)	16(10.8%)	09(5%)	12(13.9%)	043	9.4%
Obstructed Labour/ Ruptured uterus	00	08(5.4%)	09(5%)	11(12.8%)	028	6.1%
Pulmonary embolism	03(7.7%)	03(2%)	15(8.2%)	06(07%)	027	6%
Anesthesia complications	00	02(1.4%)	03(1.6%)	05(5.8%)	010	2.2%
Ruptured ectopic pregnancy	02(5.1%)	02(1.4%)	02(1.1%)	01(1.2%)	007	1.5%
Acute fatty liver of Pregnancy	01(2.6)	00	02 (1.1)	01(1.2)	004	0.9%
Indirect Causes					**081**	**17.8%**
Anaemia	00	17(11.5%)	10(5.5%)	04(4.6)	31	7.0%
Acute Hepatitis	07(18%)	05(3.4%)	14(7.6%)	02(2.3%)	028	6.1%
Cardiac disease	02(5.1%)	06(4%)	07(3.8%)	02(2.3%)	017	3.7%
Anaphylactic Reaction/Blood transfusion Reaction	02(5.1%)	00	02(1.1%)	01(1.2)	005	1.0%
Unknown Causes	00	02(1.4%)	00	00	**002**	**0.4%**
Grand Total	**39(100%)**	**148(100%)**	**183(100%)**	**86(100%)**	**456**	**100%**

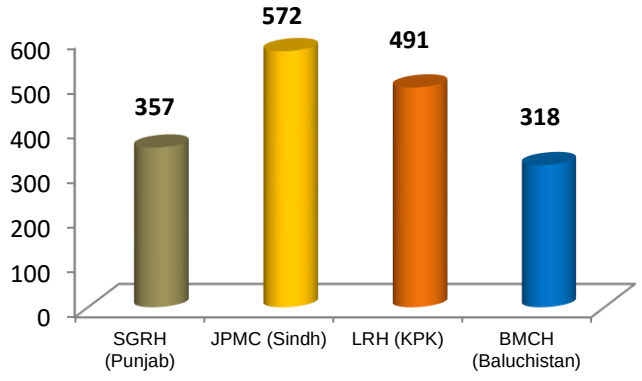


Figure 1. Maternal Mortality Ratio in different Tertiary Care Hospitals of Pakistan

Discussion

Maternal mortality ratio of a country is an indicator of its women health. It is 20 times higher in developing the world as compared to developed world.[1]It varies within countries. Results revealed a maternal mortality ratio of 451.4/100,000 live births. It varied from 318/100,000 live births in BMCH (Baluchistan) to 572/100,000 live births in JPMC, Karachi. This higher ratio at JPMC can be explained on the fact that high-risk patients from interior Sindh, southern Punjab and Baluchistan are referred here. In Southern Asia, a declining trend in maternal mortality ratio estimated by United Nations for the year 2015

is 176 with a level of uncertainty from 153 to 216/100,000 live births.[1] However, according to Global Burden of Disease, the maternal mortality ratio for Pakistan is 400.6 with uncertainty between 233 to 560.8.[9] A study conducted in India, reported that maternal mortality was higher in rural areas and in low-income groups.[10]

It is distressing that young women die of complications of pregnancy. Mean age of patients was 30.6±6.1 years and majority (56.8%) were in 21-30 years of age group in concordance to a study conducted in Karachi (30 ±5.5 years).[11] According to our results, most of the women (86.8%) did not register themselves in a maternity unit for antenatal care. Antenatal care detects and manages conditions during pregnancy that have the potential to lead to adverse maternal outcome.[12,13]In order to prevent maternal death, detection of hypertension, proteinuria, anemia and fetal mal presentation are particularly important, as is educating women and their families to recognize and respond to danger signs during pregnancy.[12,14] Lack of awareness about the importance of antenatal care, social factors and limited access to health care facilities are important contributing factors in maternal mortality.

Causes of maternal mortality are inter-related. Results revealed that 373 (81.8%) mothers died due to direct causes and 81 (17.8%) due to indirect causes. Jafarey SN compiled data on maternal mortality in Pakistan and revealed that over 80% maternal deaths were due to direct causes.[15] Same has been reported from India where 82% maternal deaths were due to direct obstetric causes.[16]In our study most of the deaths were in postpartum period. Assebaum et al reported that only one-quarter of deaths (24.1%) were in antepartum period while rest were in intrapartum and postpartum period.[17]

The majority of maternal deaths in developing countries are due to direct obstetric complications.[18] Antepartum or postpartum haemorrhage tends to be the leading cause of death, with about one quarter of all deaths attributed to severe bleeding. Haemorrhge was the most common cause of maternal mortality (33.1%) in almost all teaching hospitals with the relatively lower incidence in SGRH. Say L et al reported 24% maternal deaths due to antepartum haemorrhage.[19] Same has been observed in present study where 24.5% maternal deaths occurred due to antepartum haemorrahge and the rest were due to postpartum haemorrhage. Mandatory education and training of health professionals at all levels about Emergency Obstetric Care and inclusion of misoprostol in essential medicine list can contribute in the reduction of morbidity and mortality due to haemorrhage.[20,21]

Hypertensive disorders were the second common cause of mortality in 103(22.6%) mothers. In BMCH maternal mortality due to hypertensive disorders was lower (16.3%) than the other hospitals. This difference can be attributed to geographical variation. Data on cause of death in hospital-based studies in Pakistan revealed that maternal mortality due to hypertensive disorders ranges from 13% to 26.1%.[15]Undiagnosed and untreated hypertension in pregnancy leads to pre-eclampsia and eclampsia that adds a bulk to maternal deaths. The majority of these patients did not get their pregnancy register in maternity units and did not seek antenatal care.

Third common cause of maternal mortality was sepsis and unsafe abortions in 41(9.6%) cases. More women (15.4%) died in SGRH as compare to LRH (5%). This difference may be due to different catchment areas however; it demands an in-depth inquiry in future. Similar trends were seen in previous studies conducted in Pakistan.[15,22] In low-resource countries sepsis is more common due to poor sterilization techniques and unhygienic practices of unskilled birth attendants. Unsafe abortion conducted by untrained workers is also a major contributing factor.[4]

Women in rural areas and underprivileged women are not aware of the importance of antenatal visit. Most of them have unsupervised pregnancies and deliveries at home and come to the hospital only if they develop some serious problem in antepartum, intrapartum or postpartum period. Unsupervised childbirth may result in obstructed labour and even uterine rupture.[8,9] In this study it led to death of 5.6% mothers and this figure is double in BMCH However, none of the mortality due to obstructed labour or uterine rupture was reported at SGRH. Again this observation can be explained due to geographical variation as the patient has limited transport and road facilities in Baluchistan as compare to other provinces.

Indirect causes were seen in 81(17.8%) mothers and the most common cause was anaemia followed by acute hepatitis, similar to other studies in developing countries.[11] In 0.4% cases cause of maternal death was unknown. Many a time's patients present to hospital in terminal phase and don't revive after initial resuscitation. If there is no obvious diagnosis, the cause remains undiagnosed.

According to Pakistan health demographic survey 2006-07 besides non-availability of skilled health professionals, poverty, gender discrimination, lack of education, and socio-cultural issues were identified as barriers in seeking access to health care and family planning services. An increase in the ratio of skilled health professionals accessible to patients can improve the current situation.[18]

Shortage of skilled health providers should be addressed on a priority basis for the adequate provision of antenatal, intrapartum and postpartum care to mothers. Mass awareness should be created regarding the role of antenatal care in the reduction of maternal morbidity and mortality. Availability of basic and advanced emergency obstetric care with an adequate number of a trained health professional should be ensured to deal with intrapartum issues. Safe abortion and delivery practices with appropriate postpartum care can further reduce the burden.[23,24] According to Cochrane review community-based interventions through community health workers played a vital role in improving maternal morbidity, mortality and health-related outcomes in low and middle-income countries.[12,13] Family planning reduces maternal mortality by enabling women to prevent conception, which in turn eliminates the risk of unwanted pregnancy and mortality related to pregnancy or childbirth.[16] Steps should be taken to ensure the availability and accessibility of contraceptives to improve maternal health and reduce maternal mortality.

Conclusion

Maternal mortality ratio is alarmingly high in our country. Hemorrhage & anemia are identified as the leading direct & indirect causes of maternal death respectively. Both can be prevented by improving antenatal care and strengthening emergency obstetric care.

References

1. WHO.2015. Trends in Maternal Mortality: 1990 to 2015. Estimates by WHO, UNICEF, UNFPA, World Bank Group and United Nations Population Division. Geneva 2015.
2. Graham WJ, Ahmed S, Stanton C, Abou-Zahr CL, Cambell OMR. Measuring maternal mortality: An overview of opportunities and options for developing countries. BMC Medicine. 2008; 6(1):12.
3. WHO, International Statistical Classification of Diseases and Related Health Problems, 10th Revision, 1992.
4. Jafarey SN, Rabbani A. Maternal Mortality in Pakistan. JSOGP 2014; 4 (3):134-6.
5. World Health Organization: Health and the Millennium Development Goals 2005, Geneva World Health Organization.
6. Isyaku AM, Tilde BY, Isah S. Maternal Mortality in Developing Countries: A Threat to the Millennium Development Goal. IOSR-JNHS. 2015; 4(5): 17-21.
7. Malik MFA, Kayani MA. Issues of maternal health in Pakistan: Trends towards millennium development goal 5. J Pak Med Assoc.2014; 64 (6):690-93.
8. Siddiqui G, Hussein R, Dornan J. Dying to give birth: the Pakistan Liaison Committee's strategies to improve health in Pakistan. BJOG. 2011; 118 (2):96-9.
9. Kassebaum NJ, Bertozzi-Villa A, Coggeshall MS, Shackelford KA, Steiner C, Heuton KR et al. Global, regional and national levels and causes of maternal mortality during 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet 2014; 384(9947):980-1004.
10. Padmanaban P, Raman PS, Mavalanakar DV. Innovations and Challenges in Reducing Maternal Mortality in Tamil Nadu,India.J Health PopulNutr 2009;27(2):202-19.
11. Iftikhar R. A study of maternal mortality. J Surg Pak. 2009; 14 (4):176-8.
12. Lassi ZS, Bhutta ZA. Community-based intervention packages for reducing maternal and neonatal morbidity and mortality and improving neonatal outcomes. Cochrane Database of systematic reviews. 2015; 3.
13. Inyang MPP, Anucha OU. Traditional Birth Attendants and Maternal Mortality. IOSR-JDMS 2015; 14(2):21-6.
14. Ronsmans C, Collin S, Filippi V. Maternal mortality in developing countries. In: Samba RD, Bloem MW editors. Nutrition and Health in developing countries. Totowa NJ: Humana Press; 2008. 33-62.
15. Jafarey SN. Maternal mortality in Pakistan-Compilation of available data. J Pak Med Assoc 2002; 52 (12): 539-44.
16. Montgomery AN, Ram U, Kumar R, Jha P. Maternal Mortality in India: Causes and Healthcare Services use Based on a Nationally Representative Survey. PLOS ONE 2014; 9(1):1-11.
17. Assebaum NJ, Bertozzi-Villa A, Coggeshall MS, Shackelford KA, Steiner C, Heuton KR et al. Global, regional and national levels and causes of maternal

mortality during 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet.2014; 384 (9947):980-1004.
18. National Institution of Population Studies. Pakistan Demographic and Health Survey (PDHS) 2006-2007. National Institution of Population studies, 2007.
19. Say L, Chou D, Gemmill A, Tuncalp O, Moller AB, Daniels J et al. Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health 2014; 2: e323-33.
20. WHO recommendations for the prevention and treatment of postpartum haemorrhage. WHO, Geneva 2012.
21. Cody A, Goltz S. Policy Brief: Scaling Up Misoprostol for Postpartum Hemorrhage: Moving from Evidence to Action. Family Care International 2012. http://www.popline.org/node/654582
22. Begum S, Nisa A, Begum A. Analysis of maternal mortality in a tertiary care hospital to determine causes and preventable factors. J ayub med coll Abbottabad.2003; 15 (2): 49-52.
23. Prata N, Passano P, Sreenivas A, Gerdts CE. Maternal mortality in developing countries:challenges in scaling-up priority interventions. Women's Health. 2010; 6(2):311-27.
24. Ariff S, Soofi SB, Sadiq K, Feroz AB, Khan S, Jafarey SN, et al. Evaluation of health workforce competence in maternal and neonatal issues in public health sector of Pakistan: an assessment of their training needs. BMC Health Serv Rev. 2010; 10(1): 319.